

**ABSTRACT OF THE DISCLOSURE**

An array of diffraction grating coupled infrared photodetectors is coupled to corresponding high-speed amplifiers for creating a multiple channel high speed receiver for an optical communication system. Each photodetector includes a three-dimensional

5 diffractive resonant optical cavity formed by a diffraction grating that resonates over a narrow range of wavelengths. By creating different resonant optical cavities, the receiver detects each optical channel individually, thereby simplifying receiver design. The receiver finds ready application in systems based upon high power CO<sub>2</sub> lasers and semiconductor lasers such as quantum cascade lasers allowing extremely long line of sight communication,

10 such as between satellites. Other applications include ship to ship or ground to missile communications. These applications will benefit from increased jamming resistance and security.